

CLAIMS

WHAT IS CLAIMED IS:

1. An elongated tissue removing device, comprising:
 - a. an elongate shaft with a region for securing a tissue mass on a distal shaft section; and
 - b. a tissue expander on the elongate shaft proximal to the tissue securing region to facilitate removal of a tissue mass.
2. The elongated tissue removing device of claim 1, further comprising a cutting surface attached to said elongate shaft.
3. The elongated tissue removing device of claim 1, wherein said tissue expander comprises an inflatable balloon.
4. The elongated tissue removing device of claim 3, wherein said inflatable balloon is attached to said elongate shaft proximal of said region for securing a tissue mass.
5. The elongated tissue removing device of claim 1, wherein said tissue expander comprises a plurality of inflatable balloons.
6. The elongated tissue removing device of claim 5, wherein at least one of said inflatable balloons is attached to said elongate shaft proximal of said region for securing a tissue mass.
7. The elongated tissue removing device of claim 6, wherein at least one of said plurality of inflatable balloons is attached to said elongate shaft distal of said region for securing a tissue mass.
8. The elongated tissue removing device of claim 1, wherein said tissue expander comprises a plurality of expandable members.

9. The elongated tissue removing device of claim 8, wherein said expandable members comprise longitudinally-oriented expandable members.

10. The elongated tissue removing device of claim 8, wherein said expandable members comprise circumferentially-oriented expandable members.

11. The elongated tissue removing device of claim 8, wherein said expandable members comprise spirally-oriented expandable members.

12. The elongated tissue removing device of claim 8, wherein said expandable members comprise a mesh.

13. The elongated tissue removing device of claim 8, wherein said expandable members have at least one end connected to said elongated shaft.

14. The elongated tissue removing device of claim 8, wherein said expandable members have two ends, and each end is connected to said elongated shaft.

15. The elongated tissue removing device of claim 8, further comprising a rotatable shaft configured to effect expansion of said expandable members upon rotation of said shaft.

16. The elongated tissue removing device of claim 8, wherein said expandable members comprise a plurality of expansion surfaces having inner and outer surfaces, said outer surfaces being configured to contact tissue, said inner surfaces being configured to slidably enclose at least a portion of said elongate shaft.

17. The elongated tissue removing device of claim 16, wherein said plurality of expansion surfaces comprises a pair of expansion surfaces.

18. The elongated tissue removing device of claim 1, wherein said region for securing a tissue mass includes an anchoring member.

19. The elongated tissue removing device of claim 18, wherein said anchoring member comprises an elongated anchor element configured to deploy into tissue.

20. The elongated tissue removing device of claim 19, wherein said elongated anchor element comprises an electrosurgical element.

21. The elongated tissue removing device of claim 18, wherein said anchoring member comprises a barb.

22. The elongated tissue removing device of claim 1, wherein said region for securing a tissue mass comprises an aperture in fluid contact with a vacuum source.

23. The elongated tissue removing device of claim 1, wherein said region for securing a tissue mass comprises an aperture in fluid contact with a reservoir configured to contain an adhesive fluid.

24. A tissue dilation device for dilating the width of a path through tissue within a patient's body for removal of a tissue mass having a width greater than the path width, comprising:

- a) a proximal handle portion;
- b) a distal dilation portion comprising a pair of arms, said arms being separated by a separation distance, and a pair of dilation plates, said dilation plates having inner surfaces and outer surfaces, said outer surfaces being configured to engage tissue, said outer surfaces being separated from each other by a transverse dimension, said inner surfaces being configured to slidably enclose at least a portion of an elongate shaft with a region for securing a tissue mass on a distal shaft section; and
- c) a pivot, said pivot defining a pivot axis, said arms being rotatably connected to said pivot effective to separate said at least two arms upon rotation of said arms around said pivot axis.

25. The tissue dilation device of claim 24, wherein said handle portion comprises a pair of legs operably connected to said pivot and to said two arms, wherein movement increasing the separation distance between said two legs is effective to separate said two arms.

26. The tissue dilation device of claim 24, wherein said handle portion comprises a pair of legs operably connected to said pivot and to said two arms, wherein movement decreasing the separation distance between said two legs is effective to separate said two arms.

27. An assembly for removing a mass of tissue from within a patient's body, comprising:

a tissue securing device having an elongate shaft with a region for securing a tissue mass on a distal shaft section; and

a tissue dilation device for dilating a path within a patient's body.

28. The tissue removing assembly of claim 27, wherein said tissue dilation device comprises:

a) a proximal handle portion;

b) a distal dilation portion comprising a pair of arms, said arms being separated by a separation distance, and a pair of dilation plates, said dilation plates having inner surfaces and outer surfaces, said outer surfaces being configured to engage tissue, said outer surfaces being separated from each other by a transverse dimension, said inner surfaces being configured to slidably enclose at least a portion of an elongate shaft with a region for securing a tissue mass on a distal shaft section; and

c) a pivot, said pivot defining a pivot axis, said arms being rotatably connected to said pivot effective to separate said at least two arms upon rotation of said arms around said pivot axis.

29. The tissue removing assembly of claim 27, wherein said tissue dilation device comprises an inflatable balloon.

30. The tissue removing assembly of claim 27, wherein said tissue securing device further comprises a cutting surface attached to said elongate shaft.

31. A tissue removing kit, comprising:

a tissue securing device having an elongate shaft with a region for securing a tissue mass on a distal shaft section; and

a tissue dilation device for dilating a path within a patient's body.

32. The tissue removing kit of claim 31, wherein said tissue dilation device comprises an inflatable balloon.

33. The tissue removing kit of claim 31, wherein said tissue dilation device comprises:

a) a proximal handle portion;

b) a distal dilation portion comprising a pair of arms, said arms being separated by a separation distance, and a pair of dilation plates, said dilation plates having inner surfaces and outer surfaces, said outer surfaces being configured to engage tissue, said outer surfaces being separated from each other by a transverse dimension, said inner surfaces being configured to slidably enclose at least a portion of an elongate shaft with a region for securing a tissue mass on a distal shaft section; and

c) a pivot, said pivot defining a pivot axis, said arms being rotatably connected to said pivot effective to separate said at least two arms upon rotation of said arms around said pivot axis.

34. The tissue removing kit of claim 31, wherein said tissue securing device further comprises a cutting surface attached to said elongate shaft.

35. A method for dilating a path through a tissue bed within a patient's body, said path containing an elongated shaft at least partly therethrough, comprising:

a) enclosing at least a portion of the elongated shaft with at least a distal portion of a tissue dilation device having a distal dilation portion comprising a pair of arms, said arms being separated by a separation distance, and a pair of dilation plates, said dilation plates having inner surfaces and outer surfaces, said outer surfaces being configured to engage tissue, said outer surfaces being separated from each other by a transverse dimension, said inner surfaces being configured to slidably enclose at least a portion of an elongate shaft with a region for securing a tissue mass on a distal shaft section; and

b) enlarging said transverse dimension of said dilation portion effective to dilate a path through the tissue bed.

36. The method of claim 35, wherein said distal dilation portion of said tissue dilation device comprises at least two arms each having distal ends with outer surfaces, said outer surfaces being configured to engage tissue, further comprising

c) separating said at least two distal ends effective to engage tissue within said tissue bed.

37. The method of claim 36, wherein said tissue dilation device comprises a pivot defining a pivot axis, said arms being rotatably connected to said pivot, wherein said separating step comprises rotating said at least two arms about said pivot.

38. A method of removing a tissue specimen from a tissue bed within a patient's body, comprising:

a) positioning adjacent a tissue specimen along a path in a tissue bed within a patient's body an elongated tissue removing device comprising an elongate shaft with a region for securing a tissue mass on a distal shaft section; a cutting surface

attached to said distal section; and at least one inflatable balloon attached to said elongate shaft;

b) enclosing at least a portion of the elongate shaft with at least a distal dilation portion of a distal dilation device comprising a pair of arms, said arms being separated by a separation distance, and a pair of dilation plates, said dilation plates having inner surfaces and outer surfaces, said outer surfaces being configured to engage tissue, said outer surfaces being separated from each other by a transverse dimension, said inner surfaces being configured to slidably enclose at least a portion of an elongate shaft with a region for securing a tissue mass on a distal shaft section; and

c) separating said at least two arms;

c) inflating a balloon effective to dilate said path through said tissue bed;

d) enlarging said transverse dimension of said dilation portion effective to dilate a path through the tissue bed; and

removing said tissue specimen.

39. The method of claim 38, wherein said separating step comprises rotation of said arms around said pivot axis.

40. A biopsy device comprising:

a. an elongate shaft with a region for securing a tissue mass on a distal shaft section;

b. a cutting surface attached to said elongate shaft, and

c. a tissue expander on the elongate shaft proximal to the tissue securing region to facilitate removal of a tissue mass.

41. The biopsy device of claim 40, wherein said tissue expander comprises an inflatable balloon.

42. The biopsy device of claim 40, wherein said tissue expander comprises a plurality of inflatable balloons.

43. The biopsy device of claim 40, wherein said tissue expander comprises an expandable member.

44. The biopsy device of claim 40, wherein said tissue expander comprises a plurality of expandable members.

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